RaY

Research at the University of York St John

For more information please contact RaY at ray@yorksj.ac.uk

Introducing Artificial Intelligence into a human resources function

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Introducing Artificial Intelligence into a human resources function

Introduction

This paper explores the attitudes of employees in a strategic recruitment company towards the introduction of Artificial Intelligence, and discusses the implications for approaches to preparing employees for this kind of technological change.

Developments in technology are shifting the frontiers between the work tasks performed by people and those performed by machines and algorithms (WEF, 2018, p. vii). 'Artificial Intelligence' (AI) is a term used to describe a range of technologies and functions, but essentially it relates to a computer system's capacity to perform tasks normally requiring human intelligence (Brennen *et al.*, 2018). Technology influences the field of human resources management and has moved from static Enterprise Resource Systems to sophisticated AI software that undertakes tasks previously performed by people (Hicks, 2014). A recent global survey indicates that AI and data analysis are two of four top trends affecting the HR functions of recruitment and talent acquisition (Spar and Pletenyuk, 2018).

The use of AI has given rise to debates concerning the future of (human) employment, ethical concerns about action and responsibilities, and proposed policies to mitigate risks (see Hislop *et al.*, 2017, for an overview). Most of these issues are beyond the scope of this paper, but perceptions of the potential impact of AI on employment, it was felt, might impact on this study. Frey and Osborne (2017) predicted that by 2020, approximately 47% of total U.S. employment would be at risk due to automation. Arntz *et al*. (2016), however, challenge Frey and Osborne's assumptions, and are more optimistic about the impact of new technologies on employment. Montealegre and Cascio (2017, p. 62) also show more optimism, and argue that "history suggests it is a temporary, though painful, shock. As workers adjust their skills, and entrepreneurs create opportunities based on the new technologies, the number of jobs will rebound".

Some studies show that the use of AI already supports recruitment and selection functions: it can aid in finding hidden talents (Chwastek, 2017) and by undertaking routine tasks, such as application screening or scheduling interviews (Leong, 2018; Spar and Pletenyuk, 2018) and can thus result in efficiencies and qualitative benefits for clients and candidates (Upadhyay and Khandelwal, 2018). Cresswell (2018) argues that AI used for recruitment and selection, as it is in Unilever, can gather and analyse relevant data more quickly and objectively than human recruiters, and can overcome unconscious bias. Preuss (2018) argues that by using AI in recruitment, employers can gain a more holistic view of candidates and their suitability. In a comprehensive review of AI in recruitment and selection, Albert (2019) found that the most popular applications were screening software, task automation tools and chatbots.

However, there has been little empirical research on factors affecting the introduction of AI into the talent acquisition function, and this paper makes a contribution to this relatively unexplored field.

Cielo is a leading strategic Recruitment Process Outsourcing organisation. It trialed the use of AI into a high volume recruitment process, in order to explore the effects on efficiency and productivity, and found that there were significant benefits. As a result, it plans to apply AI more widely in future. It envisages that the responsibilities of the recruiters will increasingly be to assist candidates through an initial application and assessment phase performed by AI, which was previously conducted by the recruiters themselves. However, the successful use of AI in this context depends in large part on the acceptance of the recruiters whose jobs it will affect.

The research question addressed by this paper is:

What are the attitudes of the employees of Cielo towards the introduction of AI technology, and how could these attitudes be influenced to encourage future acceptance of AI?

The paper aims to contribute to what is likely to become a growing field of inquiry.

Technological change in organisations

Recent and rapid technological changes are likely to have a significant impact on the way in which work is undertaken in the future (Brougham and Haar, 2017; Schwab, 2015). Employees may react positively or negatively to proposed changes depending on: their assessment of the likely outcomes of the change for the wider organisation; self-interest and politics; responses to the way in which the change is introduced; and psychological and emotional factors (Balogun *et al.,* 2016). Congdon (2016, p. 12) argues: "The challenge with technology in the workplace is making it meaningful to the employee. It should help them cognitively off-load some of the tasks they have to think about today, and leverage new technologies […] to make their work lives easier and more productive." Mariani *et al.* (2013) suggest that organisations need to develop customised training strategies when introducing new technology, including taking into account age and gender, as well as levels of "tech-savviness" and education.

Psychological and emotional factors concerning technological change may include "technophobia" - an overall anxiety about interactions with computer-related or advanced technology (Khasawneh, 2018) – and "technophilia" - a strong enthusiasm for technological change, especially new technologies (Martínez-Córcoles, *et al.*, 2017). Psychological and emotional reactions have also been linked to age: older employees are thought less likely to trust radically new technologies (Knowles and Hanson, 2018).

The issue of resistance to or adoption of a new technology is the focus of Davis's (1985) Technology Acceptance Model (TAM) and the development of the model by Venkatesh and Davis, (2000), which proposes a series of factors that will influence an individual's intention to use a new technology. The factors include the perceived value and the perceived ease of use of the technology, and perceptions of the attitudes of management and colleagues towards the change. The models have been used, sometimes with further elaborations, in a variety of setting, including education, medicine and law enforcement (Watt, *et al.*, 2019).

A long-established framework for analysing the dynamics of resistance to a change is field theory, and its application through the force-field analysis model, first put forward by Lewin (1947). In many situations a quasi-stationary equilibrium exists, a balance between forces that drive for a particular change and forces that resist it (Hayes, 2018). An analysis of these forces can lead to an understanding of how a change can be achieved, by reducing the resisting forces or by increasing the drivers. This framework was used to organise the data gathered in this study.

Research methodology

This is a case study of attitudes of employees of a single organisation towards the introduction of AI. It is a mixed methods study, combining interviews and questionnaire returns, gathering and analysing both qualitative and quantitative data.

To gather information on attitudes to AI, and to technology more generally, interviews were carried out with seven employees currently using the AI system, and questionnaires were then sent to over 200 employees who had not (at that time) used the AI system, but who might be expected to do so in future. It was felt to be important to gather data both from recruiters who had used the system and from those who had not yet done so: as the system is used more widely, an understanding of the attitudes of the latter group could be critical to ensuring their acceptance and engagement. Before any respondents were contacted, research ethics approval was sought and obtained from the university with which the authors are associated.

The interviews were semi-structured, to enable a rich exploration of experiences and perceptions (Bryman, 2016). A pilot interview was conducted with a senior executive working in the field of talent acquisition in a different organisation, who was also involved in AI technology projects, and amendments were made as a result to the interview schedule and to the preliminary information for participants.

A senior manager within Cielo, who had led the introduction of the new technology and was its ongoing sponsor, proposed seven suitable interviewees to engage in the research. Discussion with the manager ensured that the sample of interviewees contained a variety of skills, backgrounds and experiences in working in the recruitment business and with the new technology. This executive also provided information about key processes in implementing the project.

Interviews were recorded, transcribed, and then coded using thematic analysis (Braun and Clarke, 2013). The coding process was supported by using a Qualitative Data Analysis Software (QDA Miner Lite) for the sake of easy comparison.

The development of the questionnaire was based on:

a) Observations and reflections arising from the interviews
b) A literature review of different conceptualisations of technophobia and technophilia, including Martínez-Córcoles *et al.*'s (2017) questionnaire

c) A critical examination of the literature and questionnaires from TAM1 and TAM2

The questionnaire was structured in four sections to gather data on individuals':

(1) usage of technologies such as email, instant messaging, social media, voice over internet programmes and smart speakers
(2) attitudes towards new information and communications technology
(3) perceptions of the efficiency of traditional recruitment software
(4) attitudes towards the new AI technology in the company

Demographic data on age was also gathered. The end of the survey offered an open question inviting respondents to express their ideas about what an organisation should do when introducing new technology to their workforce.

A pilot of the questionnaire was tested with three respondents, and the survey was amended following their feedback. The questionnaire was administered online, using Qualtrics. An email invitation was sent to 256 employees by two senior executives of the company; the invitation included information about the purpose of the research and the assurance of the respondents' anonymity

At the close of the survey, 109 completed questionnaires were returned. Responses to the survey were analysed using descriptive statistics, with thematic analysis applied to the answers to the open question.

Findings

Approximately 12 months before the field research for this study was carried out, Cielo introduced AI into some of its high-volume recruitment activities (defined as recruiting several thousand candidates per year for one client). The introduction of AI had significantly reduced the time taken to process each individual application to the scheduled interview with a hiring manager, from up to two weeks, when many of the processes were carried out manually, to an average of seven minutes when using AI.

In the traditional recruitment process, most of the work is accomplished via an Applicant Tracking System (ATS), which needs to be facilitated by a human operator to process the data, make decisions and move data between systems. With the AI system, many of these functions are taken over by technology, and consequently they can be carried out much more quickly (Hislop *et al.*, 2017; Albert, 2019). This speed can have an impact on the effectiveness of the recruitment process in a competitive market; as one interviewee said: "[…] it's really cool that a candidate can apply and schedule [an interview] the same day […], so we're able to get those offers in that candidate's hand before they have a chance to go to another interview or go look for another job."

In Cielo, the functions previously carried out manually by recruiters that were undertaken by the new technology were: job posting (i.e. advertising the

position); résumé review and screening; scheduling interviews; issuing offer letters following an interview with a hiring manager.

The senior manager who led the project said that AI was introduced in a pilot to staff members and clients as "a technology-first way of recruiting" and they were told that they would be on the "cutting edge of something new and exciting". The senior manager said: "We wanted people [in the team] that were flexible and up for something new".

The leader of the team that would undertake the pilot was involved in the process from the point where Cielo had designed and built the technology. She was then fully occupied in making the system work. The remainder of the pilot team were enrolled on or after the first implementation phase, either being hired new to Cielo, or transferring in from other teams. The team members for the first client had a week's training before the system went live. Preparation for working with the first client took place over three months – which included agreeing processes and integrating systems. The project manager said: "There were certainly some sceptics and the key stakeholder was very nervous for the first day". However, at the end of the first day the feedback was "overwhelmingly positive", with many applicants progressed to interviews. There were signs that it "was going to be tremendously successful".

The ways in which the AI was introduced were likely to have had an effect on the reactions of staff towards it (Balogun *et al.,* 2016). The involvement of the team leader from an early stage was likely to have had a beneficial effect on the practical design and functionality of the system, and perhaps encouraged acceptance by the other members of the team. However, other than issues of training in the use of the system, the manner of the technology's introduction was not raised by interviewees or by respondents to the survey.

Other than the approach to introducing AI into the organisation, three main factors emerged as supporting the willing adoption of the new technology, taking the data from the interviews and the questionnaires together:

- increase in efficiency
- demonstrable performance and quality of the technology
- ease of use of the technology

Some concerns – which can be considered as potential resisting factors to the change - were raised:

- the ability of the technology to assess applicants accurately
- some difficulties with acceptance of the technology by hiring managers (i.e. the clients) and by some applicants

The survey sought to discover whether there might be a link between acceptance of the AI system and the extent to which respondents were frequent users of new technology (or "tech-savvy"), and also whether there might be a link between acceptance of AI and the age of the respondent. However, chi-

squared analysis of the data indicated that these were not statistically significant factors.

Supporting factors

Increased efficiency

An obvious benefit of the new technology was its increased efficiency. As noted above, the time taken to process an individual application could be reduced significantly, from days to minutes. This translates into a potential to process larger numbers of applicants. As one interviewee said: "[…] since October 2017, the hiring managers that we're working with… have extended over 10,000 offers. So, for a recruiter to speak with let's say 20,000 or 30,000 to get those 10,000 offers - there's just no way it can be done." Another said: "[…] there are just so many candidates that we had to get through […], there's no way that a person […] would be able to get through the amount of work".

This success is dependent on the quality of the technology. One interviewee, who had experience of other recruitment software said: "that [system] only held about 2,000 applicants and then, once it had more, it started working slow or broke […], this new system, we've had almost like 50,000 and it [works] so well, [that's] one of the most impressive things."

Respondents to the survey were asked their reaction to the statement 'Using this technology would make it easier to do my job': 64% agreed or strongly agreed, 28% were neutral, and 8% disagreed or strongly disagreed.

Performance and quality

Interviewees said they received positive feedback from hiring managers (i.e. the clients) about the quality of the candidates that the new system produced. This was put down to two factors: the larger pool of available candidates, which provided clients with more scope for selection, and the online Emotional Intelligence (EI) assessment included during the application process, which filtered out candidates who might possess the relevant job skills, but did not match the required EI level defined by the client. One interviewee said: "[…] they're getting some other great candidates that they would not have normally reached."

In this respect, the hiring managers, and the recruitment team members, appeared to agree with the sentiments of commentators such as Cresswell (2018) and Preuss (2018), that this technology in recruitment can be seen as an enabler of more job opportunities for hidden talents, as the algorithm purely matches data which is relevant for the position. However, some concerns were also raised about quality, as discussed below.

Those who returned the survey (who at the time of replying had not yet used the AI technology) responded to the statement 'Using this technology would improve my job performance', with 50% agreeing or strongly agreeing, 37% remaining neutral, and 12% disagreeing or strongly disagreeing. In response to the statement 'I believe this new technology could improve the quality of candidates that I deliver', 46% agreed or strongly agreed, 35% were neutral and 19% disagreed or strongly disagreed. The relatively high proportions of respondents who neither agreed nor disagreed with these statements indicates some uncertainty in their evaluation of the system's quality of results.

Ease of use

All the interviewees found the new technology simple and easy to use. The training that was provided varied depending on when each individual joined the team. Four interviewees were part of the team from the outset of the programme, and they were provided with a week's training. The remaining interviewees joined the programme later, and they received a short introduction, but then learned how to use it as they went on.

Interviewees had different perceptions about the training that might be required to enable someone to use the system. For example, one said: "For someone who's not coming from an industry of recruiting or talent acquisition, it takes them about four to five days to learn the system and learn the process before they're able to go live". While another said: "From my point of view being in talent acquisition for as long as I have, working in so many ATS systems, for me, the system was very easy. […] I think maybe a day clunking around then I felt pretty comfortable." A third said: "At the beginning, there was really no, like, a set in stone way of how to do it, I just kind of learned it. I can catch on and think pretty quickly, so I picked it up right away and kind of rolled with it."

According to Mariani *et al.* (2013), it is important for organisations to consider different learning strategies when they offer training opportunities during the implementation of new technology. Mariani *et al.* argue that those training programmes need to acknowledge the different age and level of technology experience the person possesses in order to achieve a higher adoption rate.

The impact of age and general "tech-savviness" on attitude towards adopting the technology was explored as part of this research. Part of the survey attempted to assess whether respondents were more or less "tech-savvy" in terms of the frequency of their use of general information technology. A comparison of the answers to certain questions of the "more tech-savvy" (47 respondents) and the "less tech-savvy" (62 respondents) showed no statistically significant differences, however – for example, responses to the statement 'I am rarely worried that I will be overwhelmed by new technology' showed very similar profiles for each group (p = 0.85): overall 68% agreed or strongly agreed, 14% were neutral, and 18% disagreed).

In regard to age, one interviewee said: "[…] for someone who is maybe older than me [ie about 20 years of age] and who maybe wasn't that experienced in that kind of field […] I think they'd have a harder time understanding the concept of it. […] it's definitely generational." A qualitative response to the survey said: "Tailor the introduction of any new technology based on the overall/average age/experience level of the audience". In reply to a survey statement, 67% of respondents expressed the view that acceptance of new technology is influenced by age (i.e. older people are less likely to accept and trust new technology). This aligns with Knowles and Hanson's (2018) argument that younger generations are likely to adapt faster to new technologies than older generations. However, there was no statistically significant difference between the attitudes expressed by respondents of different age groups to survey questions about how quickly and easily they adapted to new technology (comparison of those under 35 years old and 35 years and older, $p = 0.16$).

Arguably, however, the above data should be treated with some caution, as they are self-reported perceptions, rather than empirical measures of performance. Khasawenh (2017) argues that even when people feel that they can cope well with new technology, changes in technology are often faster than the cognitive abilities of a human to learn or adapt. As a result, this will create a gap between individuals' skills and the technology that is introduced, which might be associated with technophobia. McClure (2018, p. 139) stresses that: "Few scholars, however, have examined the possibility that a large segment of the population is apprehensive about the quick pace of technological change and encroachment into modern life".

The findings regarding ease of use are that the simplicity and intuitiveness of the system was a key factor in enabling its adoption; that different users may benefit from different approaches to training and learning to use the new system; and that the belief that more training is needed for certain age-ranges should be treated with caution.

Potential resisting factors

In this case, at the time of the research, there appeared to be little actual resistance to the introduction of the technology. The senior project manager had indicated that there had been some scepticism about the new system before it was put into operation, but that this had been dispelled by the results it achieved. However, some of the responses from the survey indicate doubts about the system that might lead to resistance, and some challenges were experienced in relation to reactions from stakeholders outside the implementation team.

Accuracy of assessment

Although interviewees indicated confidence in the capability of the technology to assess candidates accurately against the criteria specified by the client, some concerns were expressed that candidates might learn to fool the system. As one

interviewee said: "[…] they might lie in their questions saying that they have qualifications when they don't, and it is very hard to weed or pull out those that are qualified or unqualified for the position". Another said parts of the process "[…] are reliant on the candidate being truthful and if they're not, they can clearly get past that". This raised an issue about whether the results of the system could be trusted.

In the survey, in response to the statement 'I wouldn't trust the outputs of this technology', 43% said they disagreed or strongly disagreed, 41% neither agreed not disagreed, and 16% agreed. Thus a larger proportion were inclined to trust the technology than were distrustful, but a high percentage of respondents were unsure about whether to trust it or not.

Acceptance by other stakeholders

Some difficulties were reported concerning acceptance of the new technology by the clients and by some applicants. Interviewees observed that the speed of the process raised doubts in the minds of some candidates, who were surprised by how quickly after their application they were asked to undertake an interview, without even uploading a résumé. As one interviewee said: "When we first started it was not uncommon that candidates'll call us just checking to make sure we're real. […] their feedback is: 'This is almost too good to be true. We just wanted to make sure it wasn't a scam.'"

There was also resistance from some hiring managers, who needed to change their expectations and behaviours. Some of these concerned changes to processes, others were simple adjustments to the technology. As one interviewee said: "Hiring managers like to print paper copies [of] résumés prior to the interview, but people don't have résumés anymore". Some clients missed "[…] having the comfort of what they were used to, holding that paper in their hand prior to the interview." Another interviewee said: "You can't use the technology in Explorer […] you have to use Chrome and I think that some of the hiring managers sometimes ignore that and use the one they're used to. So when they're navigating with the new system, they kind of have a hard time with it because they forget then you have to go into Chrome."

The place of the human element

It was anticipated by the researchers that there may be concerns that AI technology would replace human involvement in the process, and that people would fear for their jobs. This issue was explored in the research, but was not expressed as a concern by most respondents.

The majority of interviewees were confident that there would always a need for the human element in the recruitment and selection process, if not for high volume recruitment to low skill jobs, then certainly for higher-level positions. As one interviewee said: "I think it depends. So when it comes to entry-level, high volume repetition, I don't see a role for a recruiter. But I think

that we're always going to need recruiters for very specialised, very niche jobs. […] I see the future of high-level specialty roles, this technology being paired with a recruiter […] But honestly, it will never replace that true human interaction." It did not appear that any of the interviewees (who all had direct experience of the system) were deeply concerned about their jobs becoming obsolete, perhaps because technology will inevitably change the global workforce.

Respondents to the survey were asked to react to the statement 'New technology is making the jobs done by humans less important': 61% disagreed or strongly disagreed, 18% were neutral, and 21% agreed.

Conclusions

In this study, the introduction of AI into a high-volume recruitment process resulted in significant improvements in efficiency and productivity. The successful introduction of the new technology could be attributed to: the design of a robust system with a simple and intuitive interface; careful planning of a pilot project with a major client; involving the team leader of the pilot from an early stage in the process; enrolling individuals to the team to implement the pilot who were seen to be flexible and open to innovation; and providing suitable training for the pilot team. The TAM factors (Venkatesh and Davis, 2000) of the value of the new technology (in terms of productivity and quality of applicants), ease of use of the technology, management intent, and a positive team and team leader, were all supportive of successful adoption. Training is a key part of the successful introduction of a new technology, and influences perceived ease of use: on the basis of the experience within Cielo, it would seem appropriate to design a range of different training provision for operators, who can draw on it based on their needs, and to seek feedback from the trainees to constantly improve the training process.

The research explored whether attitudes to the new technology were influenced by the age of the respondents, or by their general "tech-savviness", but the quantitative data showed no statistically significant relationship between these factors. This research also indicates that it appears unwise to assume that age will have an impact on training needs.

This case shows that thorough briefing and training are also needed for clients, those who have less involvement in the system than the operators, so that they can use the system confidently and competently. Recruiters should also be briefed and trained to work with clients who may be challenged by the change in technology.

In this study, the increased efficiency gained through the use of AI was obvious, but there were mixed views about the quality of the assessments of candidates. Among those respondents who had not yet used the technology, but who might be expected to do so in the future, more than 50% either disagreed or were neutral about whether this technology would improve the quality of candidates recruited, and about whether they would trust the outputs of the AI

system. These are, therefore issues to be addressed in briefing, educating and training new users of the system. There is also a case for monitoring outcomes and – if these are positive – building information about accuracy and effectiveness into any training for operators new to the system, in order to address doubts and concerns about these issues. Training should include information on the benefits and challenges that come along with the technological change, and also provide the opportunity for employees to give feedback after implementation, to use first-hand knowledge to improve the change process, the training, and the technology.

This is a case study, using a relatively small sample, and these findings cannot be generalised to recruitment functions elsewhere. However the implications of the findings in Cielo can give rise to recommendations for how the use of AI can be spread inside that organisation, both in terms of managing the change overall and in terms of designing and providing training, and these recommendations may be of value to other organisations. Further research on other examples of the introduction of AI into recruitment systems should be undertaken to see if the findings at Cielo are replicated elsewhere. It would also be valuable to see further research into effective processes for briefing and training operators to use AI in this and in other HR contexts, exploring the learning and unlearning that may be needed to achieve acceptance and adoption.

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